

LEGAL NOTICE

In accordance with 40 CFR 270.42(c)(2) and effective on this date, notice is hereby given that Zinc Corporation of America (ZCA), an unincorporated division of Horsehead Industries, Inc., of Bartlesville, Oklahoma, has submitted a Class 3 Permit modification request to the Oklahoma Department of Environmental Quality (DEQ). The Facility legal description is: 150 acres more or less located in Sections 11 and 14 of T26N, R12E, Washington County, Oklahoma.

ZCA is requesting that Permit Sections III.A., V.I., V.J., V.K., V.M., V.O., V.P., V.S., the Fact Sheet and Attachment 5 of Hazardous Waste Permit No. OKD000829440 be modified to incorporate a Facility-wide corrective measures (remedy) program as well as remedy design and implementation requirements. The justification for this request is that sufficient data has been gathered to select a Facility-wide corrective measures program that, when implemented, will provide long-term protection of human health and the environment.

DEQ has reviewed the Corrective Measures Study Report (CMS) which sets forth alternatives for corrective action at the Facility and has tentatively concurred that Corrective Measure Alternative (CMA) 4 is the appropriate Facility-wide corrective measures alternative. DEQ is the sole administrative authority for the Permit and seeks public comment on the CMS, and the proposed selection of CMA 4 as the appropriate Facility-wide corrective measures program. As part of the meeting, ZCA will present information to the public on its Permit modification request. Written comments on these items may be submitted within 60 days of the date of this notice to this agency contact person:

Mr. H.A. Caves, Division Director
Waste Management Division
Oklahoma Department of Environmental Quality
1000 NE 10th Street
Oklahoma City, OK 73117-1299
(405) 271-5338

The Permittee's contact person and Facility address are:

Mr. John R. Knapp, Jr.
Senior Vice-President, Operations
Zinc Corporation of America
11th & Virginia
P.O. Box 579
Bartlesville, OK 74005-0579
(918) 336-7100

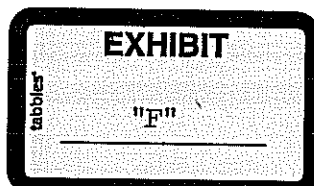
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Oklahoma Water Resources Board

A copy of the CMS, DEQ's proposed remedy selection determination, and the modification request can be found and copied at the Bartlesville Public Library. A public meeting to receive comments on the CMS and DEQ's proposed remedy selection, and to provide information on the modification request as required by 40 CFR 270.42(c)(4), will be held on April 1, 1997, at 7:00 pm at the Bartlesville City Hall located at 600 SE Dewey in Bartlesville, Oklahoma. Should you desire to attend but have a disability and need accommodation, please notify the DEQ three days in advance at 405/271-5338.

The Permittee's compliance history during the life of the above referenced Permit is available from the agency contact person. Persons wishing to comment on the CMS or the DEQ's proposed remedy selection may do so orally at the public meeting or in writing to DEQ at the address listed above. Written comments should be submitted on or before May 9, 1997.



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OWRB-033-0000078

EXECUTIVE SUMMARY

This report presents results of the Corrective Measures Study ("CMS") performed for the Zinc Corporation of America ("ZCA") zinc refinery ("Facility") located in Bartlesville, Oklahoma. The CMS was conducted in accordance with the *Final Corrective Measures Study (CMS) Work Plan (Work Plan)* (RSA, 1995a) which was approved by the Oklahoma Department of Environmental Quality ("DEQ") on December 5, 1995. The CMS was performed on an accelerated schedule approved by DEQ to evaluate potential Corrective Measure Alternatives ("CMAs") applicable to conditions found at the Facility during the RCRA Facility Investigation ("RFI"). Additionally, the RFI and CMS work plans and other reports referenced herein, provided data and information utilized in the investigation and corrective action process. These reports form a foundation for the work presented in this CMS Report and the reader is referred to them for assistance in fully understanding the CMS.

Based on the RFI data, as well as data obtained as part of the various ongoing Interim Measures being performed at the Facility (air monitoring, dust suppression/surface water controls and groundwater monitoring), the CMS Work Plan identified three (3) media of concern (soils and waste, surface water and groundwater) and three (3) constituents of potential concern (lead, cadmium and arsenic) for consideration in the CMS. Potential zinc migration in groundwater was also considered in relation to ecological impact. As approved by the DEQ, the CMS employs a Facility-wide approach for consideration of the CMAs utilizing a Corrective Action Management Unit ("CAMU") which was established to facilitate management of stormwater and other remediation waste at the Facility.

The CMS primarily focuses on the elimination of 1) possible human exposures to soils and waste with lead, cadmium and arsenic levels above industrial use soil standards and 2) stormwater impacts occurring from such Facility soils and waste. The Facility has been prohibited from discharging stormwater or process water since 1980, and ZCA maintains several on-site surface impoundments, a water treatment plant and

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two (2) permitted deep injection wells for stormwater and process water control. Elimination of the potential for discharge of impacted stormwater and the need for extensive stormwater controls for the Facility is a major goal of the CMS. The corrective measures recommended for implementation for soils and waste will serve to eliminate impacts to surface water.

Air monitoring has indicated that the existing interim measure dust suppression activities have been effective at maintaining metals levels significantly below regulatory standards; therefore, the air pathway under such interim measure controls does not threaten public health or the environment. The corrective measures recommended for implementation for soils and waste will provide permanent prevention of dust emissions.

The constituents in groundwater at the Facility do not pose a threat to human health or the environment because of the predominance of clay in the subsurface soils, the lack of significant transfer of constituents in the soils and waste to the underlying groundwater, and the retarded movement of the constituents in the groundwater system. These findings are supported by site-specific data from monitoring of groundwater quality, groundwater use in the area of concern and the adsorptive capacity of the Facility soils. These findings were further confirmed by the results of a groundwater flow and transport model (Appendix A) and subsequent evaluations performed as part of the Focused Risk Analysis ("FRA") (Appendix B). The corrective measures recommended for implementation for soils and waste will serve to further limit potential impacts to groundwater. Restoration of the Facility groundwater to background quality is technically impracticable due to the soil adsorption phenomenon and the presence of extensive subsurface fill materials in contact with the groundwater. Therefore, long-term monitoring in the post-closure period is the only action proposed for groundwater at the Facility.

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To facilitate the evaluation of CMAs on a Facility-wide basis, the soils and waste were divided into five (5) classes in the CMS Report based on their characteristics. These Facility-wide classes as defined in the Work Plan are as follows:

- Class I: Areas Below Corrective Action Levels
- Class II: Active Industrial Areas Exceeding Corrective Action Levels
- Class III: Non-Active Areas Exceeding Corrective Action Levels - with Existing Vegetative Cover
- Class IV: Non-Active Areas Exceeding Corrective Action Levels - with Exposed Materials
- Northeast Area: The Buffer Zone between Residential and Industrial Areas

Most of the area originally meeting the definition of "Class I" in the CMS Work Plan is being addressed under the Northeast Area Investigation and Remedial Action Plan (RSA, 1996d) which, after a public meeting and public comment period, was approved by DEQ on June 7, 1996. Therefore, the CMS report does not include further evaluation of corrective measures for the Northeast Area.

The remaining Class I area, as well as the Class II, Class III and Class IV areas, are all evaluated on a Facility-wide basis in this CMS report. The general response actions and technologies developed in the CMS Work Plan were expanded to include process options that were evaluated and screened based on effectiveness, implementability and relative cost. The process options, remaining after the screening effort, were combined to form response actions applicable to each class of materials. These response actions were then combined to form five (5) Facility-wide CMAs. All CMAs utilize the CAMU established for the Facility.

The five (5) CMAs developed and evaluated in the CMS include the following:

- CMA 1: No Action, used as a baseline for comparison of other CMAs

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- CMA 2: Institutional Controls, including various Facility security, monitoring and maintenance controls, fencing, warning signs, and deed notices
- CMA 3: Capping of soils, waste and surface impoundment sediments, without structure demolition
- CMA 4: Capping of soils, waste and surface impoundment sediments, with partial structure demolition
- CMA 5: Capping of soils and waste and off-site disposal of waste pile and surface impoundment sediment materials with partial structure demolition

CMA 2, Institutional Controls, does not meet industrial use soil standards nor is it sufficient to eliminate the impacts to stormwater from waste piles and surface impoundment sediments, and thus requires continued on-site stormwater management. CMAs 3, 4, and 5 all meet the industrial use soil standards, protect stormwater from impacts and allow continued use of portions of the Facility for on-going or new industrial purposes. Under CMA 3, all existing buildings, utilities, and services remain, while CMAs 4 and 5 propose partial structure demolition. CMAs 3 and 4 maintain all of the waste pile materials and surface impoundment sediments on-site under a multimedia cap. CMA 5 includes excavation with off-site disposal of all waste pile materials and surface impoundment sediments, but still requires soil caps in the areas from which those materials are removed. Implementation of CMAs 3, 4, and 5 will all require construction sequencing and coordination with off-site remediation to ensure proper stormwater management.

The Facility-wide CMA that best meets the goals and objectives of the CMS and is proposed for implementation at the Facility is CMA 4. CMA 4 will allow for the continued industrial use of the Facility by relocating utilities above ground, maintaining the WWTP and UIC wells, and providing site security. It will also result in expanding the beautification project, that was implemented on the northeast and

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southeast portions of the Facility, to the north and west sides of the Facility. CMA 4 includes the following components:

- Class I: In-place containment using 6 inches of additional soil and vegetative cover.
- Class II:
 - 1) Certain plant structures would be demolished to slabs/foundations, demolition rubble would be disposed on-site, and a 24-inch soil cap would be placed in non-paved areas. Additional in-place containment would be added in certain areas using a combination of new asphalt and concrete as well as upgraded paving in existing paved areas.
 - 2) Surface Impoundment SIS.4 sediments would be solidified and consolidated into the area adjacent to the waste piles.
- Class III: In-place containment using 18 inches of additional soil cap.
- Class IV:
 - 1) Waste pile materials would be re-graded and contoured in their existing general location to create suitable slopes for multimedia capping. This would result in a substantially lower profile, with a reduction in maximum height of approximately 30 feet. This height reduction of over 50% would result in a maximum elevation similar to that which currently exists in the Class III area. During re-grading, the waste piles would be solidified as needed for load bearing purposes. The fertilizer plant would be demolished.
 - 2) Surface impoundment sediments would be solidified and consolidated in the area adjacent to the waste pile area.
 - 3) The solidified waste pile materials, impoundment sediments and underlying soils and waste would be contained using a single, continuous multimedia cap with the following components:
 - ▶ 4-oz. geotextile base
 - ▶ 6 inches of clay
 - ▶ 40-mil geomembrane
 - ▶ drainage net/geotextile
 - ▶ 24 inches of soil
 - ▶ vegetative cover

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- 4) The remaining surface impoundment areas, from which sediments have been removed, would be covered using a soil cap consisting of 18 inches of additional soil cap.
- 5) These components would be implemented in conjunction with closure of Landfill LF.1, completion of Facility-wide beautification, and post-closure monitoring and care.

The estimated present worth cost to implement CMA 4 is \$26,400,000 (which includes a capital cost of \$24,900,000 and annual operation and maintenance (O&M) costs (undiscounted) of \$100,000), and the estimated time for implementation is 2-years. Once CMA 4 is implemented, the interim measures for the Facility will cease and a long-term post-closure groundwater monitoring and Facility maintenance program will be established.

CMA 4 is the preferred alternative over CMA 3 because it requires partial structure demolition that will allow a more uniform soil cap to be placed over impacted soils and waste, thereby increasing the effectiveness and useful life of the cover, reducing long-term operation and maintenance, and providing for easier construction and greater cost effectiveness. Further, the cost to implement CMA 4 is approximately \$8,700,000 less than CMA 3.

CMA 4 is also the preferred alternative over CMA 5. CMA 4 proposes consolidation and containment of the waste piles and surface impoundment sediments on-site while CMA 5 proposes off-site disposal of an estimated 550,000 tons of material. The current Oklahoma commercial hazardous waste landfill capacity is not sufficient to accommodate its regular customers as well as this new volume of material. Therefore, additional capacity would have to be found outside of Oklahoma or be constructed in Oklahoma prior to implementation of CMA 5, which could seriously delay its implementation.

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Although CMA 5 proposes off-site disposal of the waste pile and sediment materials, the remaining soils and waste beneath the waste pile area, along with the soils and waste materials in the other areas of the Facility, will still require capping in order to eliminate impacts to stormwater. Therefore, both CMA 4 and CMA 5 require the same amount of long-term maintenance and offer the same degree of protection of human health and the environment. Thus, CMA 5's removal actions provide no additional benefit over CMA 4 for protecting stormwater and groundwater or for eliminating possible human exposures to soils and waste exceeding industrial use standards.

CMA 5 presents substantially higher short-term risks to the public than CMA 4 due to the increased risk of traffic accidents and material releases during transportation. An estimated 7.7 million transportation miles would be required to ship the 550,000 tons of material to the USPCI/Laidlaw hazardous waste landfill near Waynoka, Oklahoma. Based on Oklahoma's highway statistics, this would result in 19 accidents, 12 injuries, and a 1 in 5 probability of a fatality for CMA 5. The additional material handling requirements (an estimated 22,000 truck loads) associated with CMA 5 increase the potential for off-site releases from accidents, handling and equipment. The additional material handling also increases the potential for workers to suffer heat related injuries/illnesses as a result of wearing protective clothing and respiratory equipment during periods of extreme heat over an estimated 4-year implementation period.

Finally, the estimated cost of CMA 5 is \$129,800,000 (includes a capital cost of \$128,200,000 and annual O&M costs (undiscounted) of \$100,000), which is five (5) times the estimated cost of CMA 4. Given that each of these alternatives provides the same degree of long-term protection of public health and the environment and considering the greater potential for adverse short-term impacts associated with CMA 5 and its extended time to implement, there is no benefit or other basis to support the

Corrective Measures Study (CMS) Report and Summary
Zinc Corporation of America, Bartlesville, Oklahoma

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September 19, 1996

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increased cost and risk of CMA 5 over CMA 4. As a result, CMA 4 has been identified as the preferred alternative for the Facility.